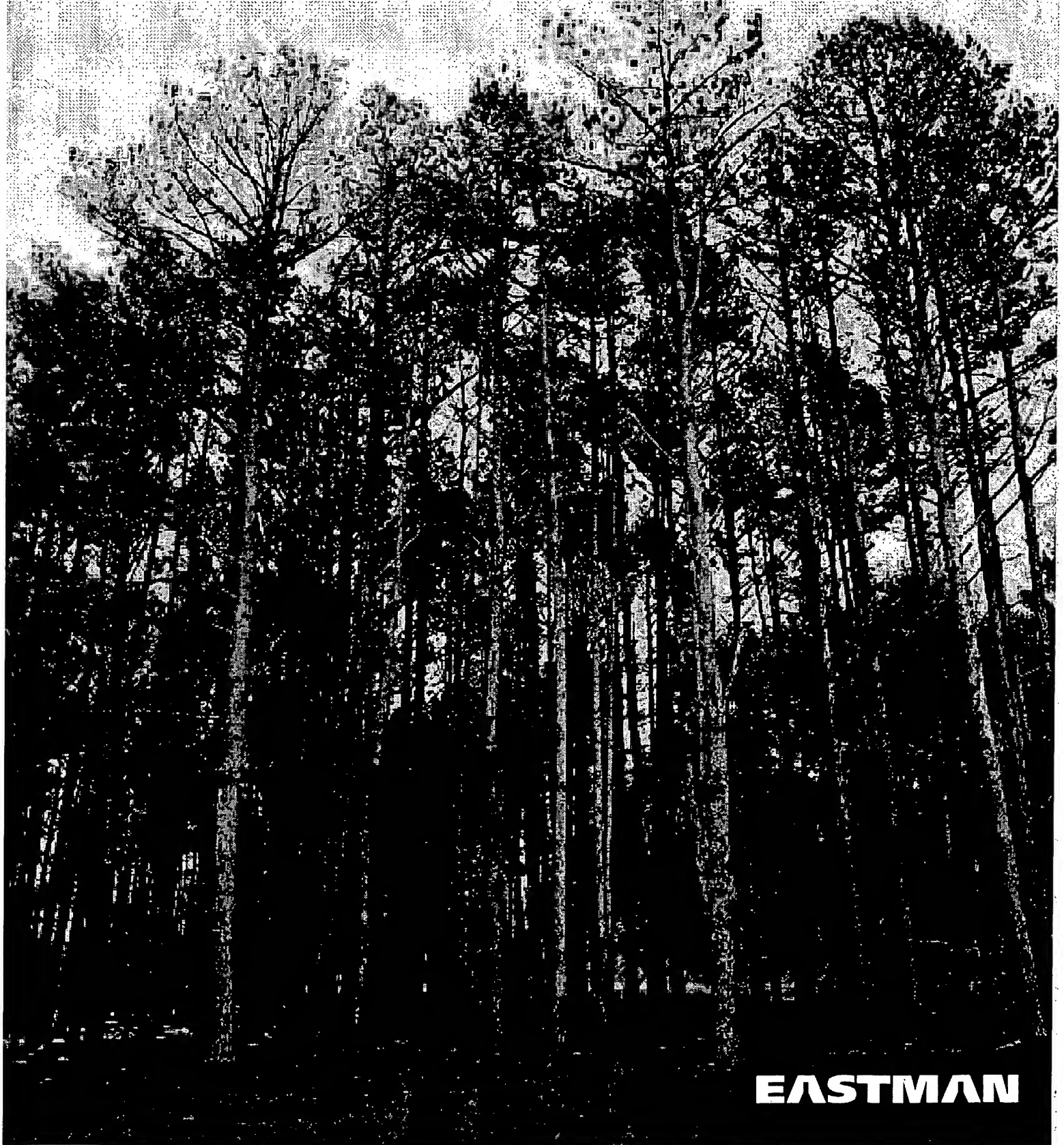


Product Listing - Gum Esters -
Eastman

Eastman Rosin Products



EASTMAN

Eastman Rosin Products

*Natural resins for
adhesion, wetting, and
viscosity control*

Eastman Chemical Company markets rosin and hydrocarbon resins worldwide, offering the greatest number and variety of resins available from a single producer.

Rosin has a unique structure that can provide products with low molecular weights, high softening points, and tailored functionality.

Rosin and its derivatives offer useful properties in numerous applications by providing specific adhesion, improved wetting characteristics to various substrates, and viscosity control.

As a natural product, rosin is useful in food applications such as chewing gums or wherever stringent regulatory clearances are required.

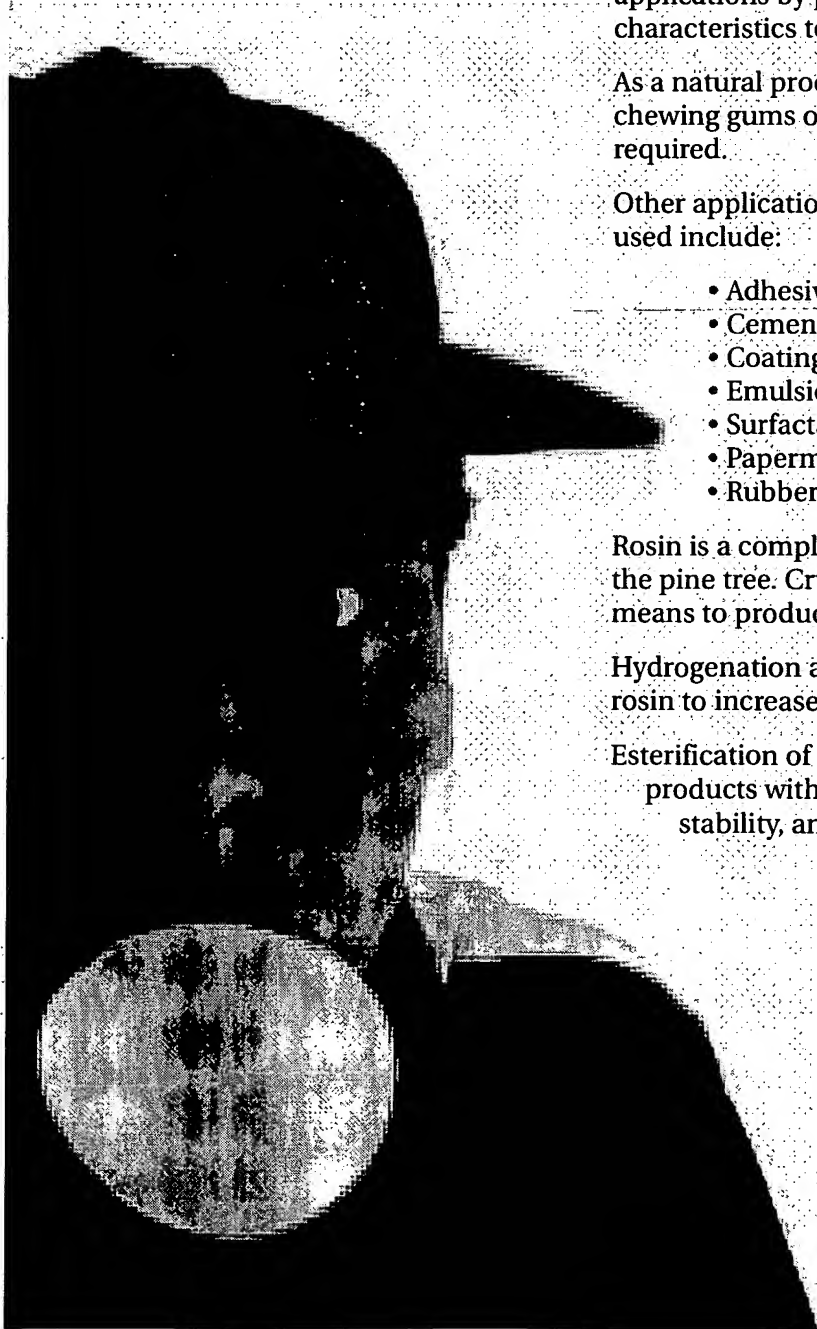
Other application areas where rosin and rosin-based resins are used include:

- Adhesives
- Cement and Asphalt
- Coatings and Sealants
- Emulsion Polymerization
- Surfactants
- Papermaking
- Rubber and Plastics

Rosin is a complex mixture of organic materials produced by the pine tree. Crude rosins are treated by chemical and physical means to produce refined rosins and modified rosins.

Hydrogenation and polymerization are common ways to modify rosin to increase thermal and oxidative stability.

Esterification of these different rosin acids provides an array of products with softening points from liquid to 180° C, increased stability, and resistance to crystallinity.



Eastman Rosin Products for the U.S. Market

Typical Values

Product	Source	Description, Base Resin	Softening Point, °C ^a	Color Gardner ^b	Acid Number	End Use
Rosin and Modified Rosins						
<i>Pamite 79</i>	US	Tall Oil Rosin	71	8	164	Binders, emulsifiers, paper size
<i>Pamite 79-1</i>	US	Tall Oil Rosin	66	7	158	Binders, emulsifiers, paper size
<i>Pamite 90</i>	US	Tall Oil Rosin	73	8	175	Binders, emulsifiers, paper size
<i>Poly-Pale</i>	AP	Partially Dimerized Rosin	95	8	142	Adhesives, sealants
<i>Dymerex</i>	AP	Dimerized Rosin	138	9	140	Adhesives, sealants
<i>Polystix 90</i>	US	Partially Dimerized Rosin	86	8	150	Adhesives, sealants
<i>Permalyn NC-11</i>	US	Noncrystalline Rosin	86	7	157	Adhesives, sealants
<i>Foral AX-E</i>	NL	Hydrogenated Gum Rosin	81	1	165	Adhesives, sealants, solder flux, pigment coating
<i>Staybelite Resin-E</i>	NL	Partially Hydrogenated Gum Rosin	80	5	162	Pigment coating, adhesives, solder flux
Rosin Alcohol and Special Derivatives						
Rosin Alcohol						
<i>Abitol-E</i>	NL	Rosin	Liquid	1 ^c	0.1	Adhesives, ski wax
Triethylene Glycol Esters						
<i>Staybelite Ester 3-E</i>	NL	Partially Hydrogenated Gum Rosin	Liquid	7 ^c	8	Adhesives, cosmetics
Methyl Esters						
<i>Abalyn D-E</i>	NL	Rosin	Liquid	4 ^c	5	Cosmetics, perfumery, adhesives
<i>Abalyn E</i>	NL	Rosin	Liquid	5 ^c	5	Adhesives
<i>Foralyn 5020-F</i>	NL	Partially Hydrogenated Gum Rosin	Liquid	3 ^c	6	Adhesives, cosmetics, perfumery
Glycerol Esters						
<i>Eastman Ester Gum 8D-SP</i>	US	Rosin	85	7 ^c	7	Chewing gum
<i>Eastman Ester Gum 10D</i>	US	Partially Dimerized Rosin	110	9 ^c	6	Chewing gum
<i>Poly-Pale Ester 10</i>	AP	Partially Dimerized Rosin	110	9 ^c	6	Adhesives, sealants
<i>Foral 85-E</i>	NL	Hydrogenated Gum Rosin	85	2	9	Adhesives, sealants
<i>Foralyn 90</i>	NL	Hydrogenated Gum Rosin	85	1	9	Adhesives, sealants
<i>Permalyn 2085</i>	US	Tall Oil Rosin	86	6 ^c	9	Adhesives, sealants
<i>Staybelite Ester 10-E</i>	NL	Partially Hydrogenated Gum Rosin	86	6	9	Adhesives, sealants, cosmetics
<i>Pentrex 28</i>	US	Modified Rosin	128	6	35	Bookbinding, coatings
Pentaerythritol Esters						
<i>Foral 105-E</i>	NL	Hydrogenated Gum Rosin	105	6	14	Adhesives, sealants
<i>Foralyn 110</i>	NL	Hydrogenated Gum Rosin	109	2	14	Adhesives, sealants
<i>Pentalyn H-E</i>	NL	Partially Hydrogenated Gum Rosin	107	8 ^c	14	Adhesives, sealants
<i>Pentalyn C</i>	AP	Partially Dimerized Rosin	126	11	11	Adhesives, sealants
<i>Pentalyn K</i>	AP	Dimerized Rosin	178	14	11	Graphic arts, coatings
<i>Permalyn 3100</i>	US	Tall Oil Rosin	99	5 ^c	10	Adhesives, sealants
<i>Pentalyn 344</i>	AP	Light Rosin	97	6	9	Adhesives, sealants

^aRing and ball.

^bGardner color: 50% solids in toluene, unless otherwise noted.

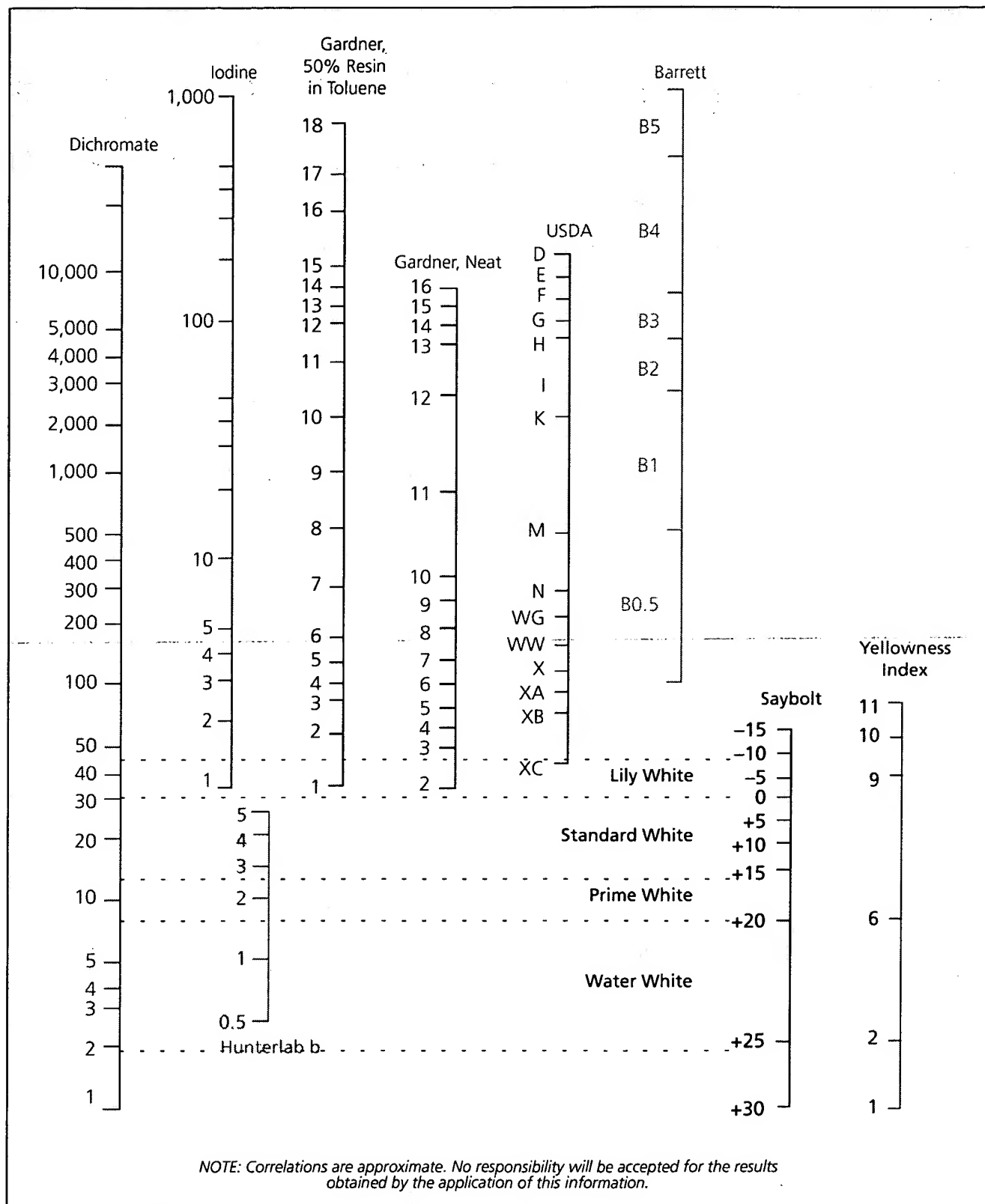
^cGardner color: neat.

AP = Asia Pacific

NL = Netherlands

US = United States

Eastman Correlation Chart of Various Color Scales



Test Methods:

Dichromate: mg/1,000 ml H₂SO₄, H-90-2c

Saybolt: ASTM D156

Iodine: mg/100 ml H₂O

Gardner: ASTM D1544-80

Hunterlab: ASTM E450

USDA: R-25-4a

Yellowness Index: ASTM D1925

Eastman Rosin-Based Resins

Esterification Alcohols	Rosin Acid ^a						
	<i>Foral</i> AX E (72)	<i>Staybelite</i> Rosin E (72)	Hydrogenated Rosin E (73)	Tall Oil Rosin (73)	Resin 861 (74)	<i>Poly-Pale</i> (96)	<i>Dymerex</i> (140)
Methanol CH ₃ OH		<i>Hercolyn</i> DE Liquid					
Triethylene Glycol HO(CH ₂ CH ₂ O) ₃ H		<i>Staybelite</i> Ester 3E Viscous Liquid					
Glycerol HOCH ₂ CH(OH)CH ₂ OH	<i>Foral</i> 85 E (80)	<i>Staybelite</i> Ester 10E (80)	<i>Foralyn</i> 90 (80)	Ester Gum 8DSP (83) <i>Permalyn</i> 2085 (85)		<i>Poly-Pale</i> Ester 10 (103) Ester Gum 10D (103)	
Pentaerythritol C(CH ₂ OH) ₄	<i>Foral</i> 105E (99)	<i>Pentalyn</i> HE (99)	<i>Foralyn</i> 110 (99)	<i>Permalyn</i> 3100 (99)	<i>Pentalyn</i> 344 (100)	<i>Pentalyn</i> C (124)	<i>Pentalyn</i> K (176)

^aNumbers in () = Softening Point; Ring and Ball, Approximate

Typical Values

The values presented in this brochure are average values for typical resin samples and should not be construed as product specifications.

Food-Contact Information

Before using any of these products in food-contact applications, refer to Title 21, Code of Federal Regulations, Part 174.5 (General Provisions Applicable to Indirect Food Additives) and the full text of each listed FDA regulation for applicable limitations or restrictions. Use of these products is subject to the limitations given in the following sections of Title 21:

- 73.1(b) Diluents in color additive mixtures for food use exempt from certification
- 172.210 Coatings on fresh citrus fruit
- 172.515 Synthetic flavoring substances and adjuvants
- 172.615 Chewing gum base
- 172.735 Glycerol ester of wood rosin
- 175.105 Adhesives
- 175.125(b) Pressure-sensitive adhesives
- 175.300 Resinous and polymeric coatings
- 175.320 Resinous and polymeric coatings for polyolefin films

- 175.380 Xylene-formaldehyde resins condensed with 4,4'-isopropylidenedi-phenol-epichlorohydrin epoxy resins
- 175.390 Zinc-silicon dioxide matrix coatings
- 176.170(a) Components of paper and paper-board in contact with aqueous and fatty foods
- 176.180 Components of paper and paper-board in contact with dry food
- 176.200 Defoaming agents used in coatings
- 176.210 Defoaming agents used in the manufacture of paper and paperboard
- 177.1200 Cellophane
- 177.1210(b) Closures with sealing gaskets for food containers
- 177.1400 Hydroxyethyl cellulose film, water-insoluble
- 177.2600 Rubber articles intended for repeated use (Plasticizer-total not to exceed 30 percent by weight)
- 178.3120 Animal glue
- 178.3800 Preservatives for wood
- 178.3850 Reinforced wax
- 178.3870 Rosins and rosin derivatives

Further regulatory information is available through your Eastman Chemical Company representative or through the addresses noted on the back cover of this brochure.

Eastman Rosin Derivatives FDA Clearances

Product	73.1(b)	172.210	172.515	172.615	172.735	175.105	175.125(b)	175.300	175.320	175.380
Abalyn E						■		■		■
Abitol E						■				
Dymerex						■	■	■	■	■
Foral 85 E						■	■	■	■	■
Foral 105E						■	■	■	■	■
Foral AXE		■				■	■	■	■	■
Hercolyn DE ¹	■		■	■		■	■	■	■	■
Eastman Ester Gum 8D-SP ²	■		■	■		■	■	■	■	■
Eastman Ester Gum 10D ²	■		■	■		■	■	■	■	■
Eastman Resin NC-11						■	■	■	■	■
Foralyn 90						■		■		
Foralyn 110						■		■		
Foralyn 5020F						■	■	■	■	■
Pamite 79						■	■	■	■	■
Pamite 79-1						■	■	■	■	■
Pamite 90						■	■	■	■	■
Pentalyn 344						■		■		■
Pentalyn C						■		■		■
Pentalyn K						■		■		■
Pentrex 28						■				
Permalyn 2085						■				
Permalyn 3100						■				
Poly-Pale						■	■	■	■	■
Poly-Pale Ester 10						■	■	■	■	■
Polystix 90						■		■	■	■
Polystix 100						■				
Staybelite Resin E		■		■		■	■	■	■	■
Staybelite Ester 3 E						■	■	■	■	■
Staybelite Ester 10 E						■	■	■	■	■

¹For use only in resinous and polymeric coatings on metal substrates.

²Kosher certified.

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175.390

176.170(a)

176.180

176.200

176.210

177.1200

177.1210(b)

177.1400

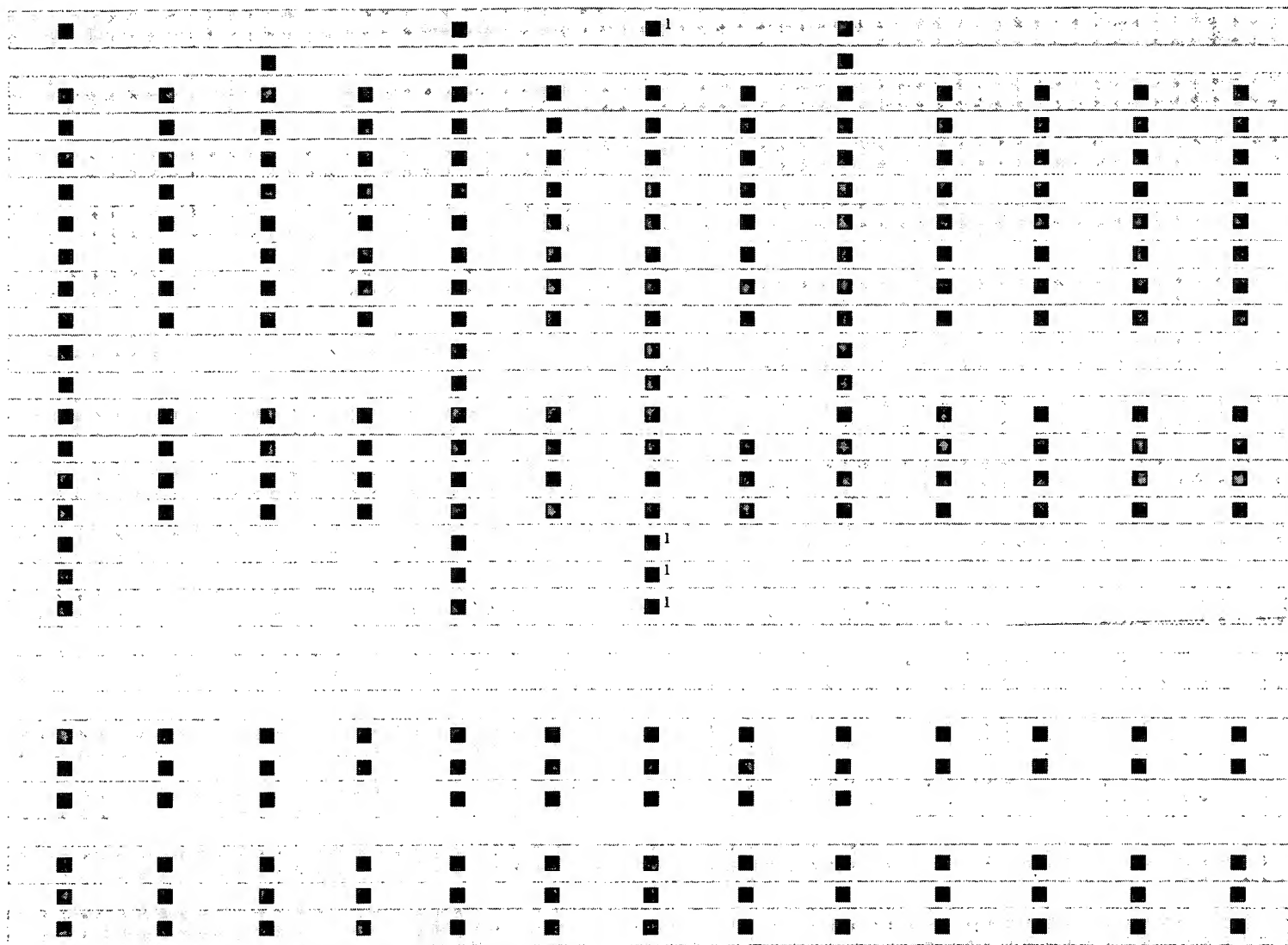
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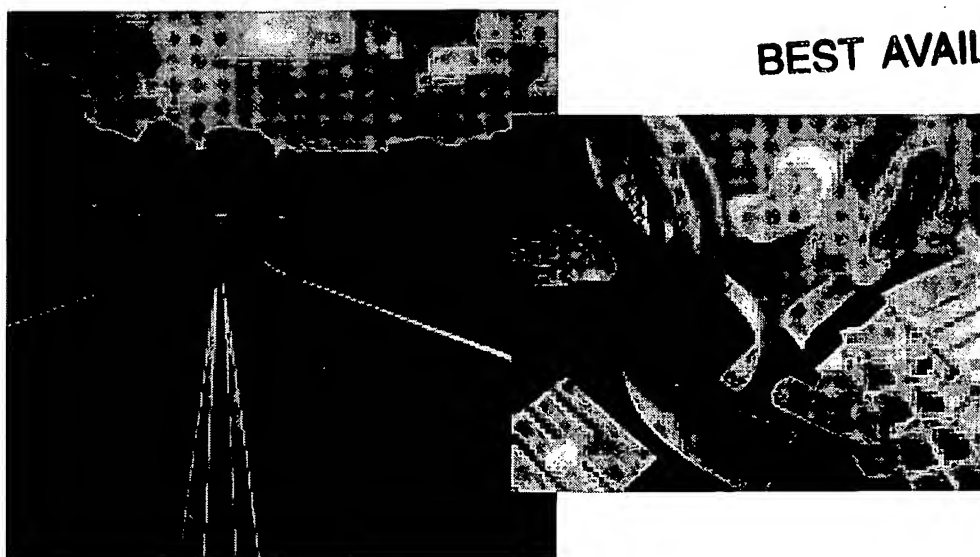
178.3800

178.3850

178.3870



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Contact Eastman to learn how the unique properties of rosin can make a difference in your applications.

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Material Safety Data Sheets providing safety precautions that should be observed in handling and storing Eastman products are available online or on request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

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